ULDB TDI "PROTOTYPE BOARD"

Thermal Test Procedure

Version 1.0

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Signature Sheet

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CHANGE INFORMATION PAGE

Version	Date	Description	Affected Pages
1.0	03/08/2000	Original.	All

1. Overview

This document describes the ULDB TDI Thermal Test that is to be performed on the prototype TDI card.

1.1 Test Purpose

The purpose of this test is to demonstrate that all functions of the TDI board work properly under varying temperature conditions and to measure the thermal characteristics of the TDI board at temperature extremes.

1.2 Test Organization

As illustrated in Figures 1.2-1, 1.2-2 and 1.2-3, this test consists of

a. 1 survival cycle demonstrating the TDI's ability to turn on/off at the temperatures specified in the TDI requirements document,
b. 1 survival cycle demonstrating the TDI's ability to turn on/off at –40C and +80C degrees

and

c 4 thermal cycles to demonstrate the operability of the TDI board at –40C through +80C degrees.

Note that this test may be stopped and restarted to minimize 24 hour operations. The test may be stopped and restarted after steps 3.3, 3.4, 3.5 and 3.6. If the test is suspended, the verification of the test setup as detailed in steps 2.2 through 3.1 must be performed again.

1.3 Applicable Documents

The following documents are applicable to this document:

The Ultra Long Duration (ULDB) TDRSS Data Interface (TDI Requirements And Functional Specifications, Version 1.0.0	September, 1999
Ultra Long Duration Balloon(ULDB) TDRSS Data Interface (TDI) Test Plan	December,1999
Ultra Long Duration Balloon (ULDB) TDRSS Data Interface (TDI) Interface Control Document	January, 2000
Electrostatic Discharge Control, NASA-STD-8739.7	December, 1997
ULDB Environmental Test Guidelines	November, 1999
TDI "ULDB MODE" System Functional Test Procedure	March, 2000
TDI "LDB MODE" System Functional Test Procedure	March, 2000

1.4 Configuration Management

This document shall be managed by the ULDB TDI development team. Changes to this test procedure shall require the approval of the Ultra Long Duration (ULDB) TDRSS Data Interface (TDI) Product Development Lead.

During the execution of this test, typographical and procedural flow changes may be made at the discretion of the TDI Test Engineer. The changes will then be submitted for approval at the conclusion of the test.

After test execution, the completed test procedure shall be maintained by the TDI team as an "As Run" procedure.

1.5 Quality Assurance

This test will not be monitored by quality assurance. However, prior to the execution of this test, the test engineer shall verify the test configuration, test equipment calibration, documentation and ESD certification of test personnel. After this initial verification, testing shall commence. If anomalies are encountered during the execution of this test, the TDI Systems Engineer shall be notified. The execution of this test procedure shall be documented on a GSFC Work Order Authorization (WOA). Any anomalies shall be logged as a Non-Conformance Report (NCR) as per the GSFC QMS. At the conclusion of the test, the TDI Systems Engineer shall review the test results and approve any typographical changes or procedural flow deviations.

2. Test Setup

2.1 Test Personnel

This test shall be performed by one or more test conductors:

_____
Test Conductor # 1

_____
Test Conductor #2

2.2 Documentation Required

To commence testing, a signed copy of this test procedure, the TDI "ULDB MODE" System Functional and TDI "LDB MODE" System Functional test procedures are required. Additionally, a GSFC WOA is required.

All test procedures have been signed: Check_____

A GSFC WOA is in place. WOA Number:_____ Event #:_____

2.3 Equipment Required

The following equipment is required for this test. Refer to the test plan for configuration details.

	Cal ID	Cal Date
PC-104 development system OR "flight like CDM"		
TDI Board		
Bit Sync with viterbi decoder		
HP 8015A Pulse Generator	_____	_____
Firebird 6000 Communications Analyzer	_____	_____
Phillips PM6680B High Resolution Prog Timer/Counter	_____	_____
Tenny BTC 942 Thermal Chamber	_____	_____
Omega Thermocouple System	_____	_____
3 GN2 Tanks with regulator and tubing		
GN2 Flow Meter		

ULDB TDI "Diagnostic Software"
Power supply
Digital MultiMeter _____ _____

All required calibratable test gear is in calibration Check:_____

2.4 Test Configuration

The test set-up is configured as in Figure 2-4-1. Check:_____

2.5 ESD Precautions

All TDI hardware shall be handled in compliance with NASA-STD-8739.7 for Electrostatic Discharge Control. All test personnel shall have current ESD certification. All test areas and benches shall also be ESD certified and test area shall be maintained between 30% and 70% humidity.

Wrist straps shall be worn at all times while either handling or within 3 feet of the TDI hardware. These wrist straps shall be verified for resistance at least 1 time each day. Non-static generating garments shall be worn by test personnel when within 3 feet of the TDI board.

Test facility is between 30% and 70% humidity. Check:_____

Test personnel have ESD certification. Check:_____

Wrist straps are functioning. Check:_____

Non-static generating clothing is worn. Check:_____

3. Thermal Test Procedure

3.1 Test Initialization

TEST ITEM IDENTIFICATION

(1) Verify that the PC 104 development system or "flight like CDM" is powered off. Check:_____

(3) Record the serial number of the TDI board. SN:_____ Check:_____

(4) Record the FPGA Silicon Signature Number: Sig Num:_____ Check:_____

(5) Verify that the TDI ULDB Mode select jumper is removed. Check:_____

(6)Record TDI board IRQ and Base Address settings.
IRQA: _____ IRQB:_____
Base Addr:_____ Check:_____

GSE SETUP

(7) Verify that the TDI GSE rack is powered off. Check:_____

(8) Verify that the GSE telemetry cable is connected to TDI connector P4 Check:_____

(9) Verify that the GSE Discrete Deck Select cable is connected to TDI connector P3 Check:_____

(10) Verify that the GSE test point cables are connected to TDI connectors P5 and P6Check:_____

(11) Power the GSE Rack Check:_____

(12) Verify the Bit Sync Stored format settings.

a. Enter 130 on bit sync key-pad and verify
Data Rate = 3.000*10**5
Input Code = 0 (NRZ-L)
FEC Code = 2 (BPSK-D)
FEC Rate=1 (1/2)

b. Enter 131 on bit sync key-pad and verify
Data Rate = 1.500*10**5
Input Code = 0 (NRZ-L)
FEC Code = 0 (OFF)
FEC Rate= N/A

c. Enter 132 on bit sync key-pad and verify
Data Rate = 2.000*10**3
Input Code = 0 (NRZ-L)
FEC Code = 2 (BPSK-D)
FEC Rate = 1 (1/2)

d. Enter 133 on bit sync key-pad and verify
Data Rate = 1.000*10**3
Input Code = 0 (NRZ-L)
FEC Code = 0 (OFF)
FEC Rate = N/A

e. Enter 134 on bit sync key-pad and verify
Data Rate = 1.000*10**5
Input Code = 0 (NRZ-L)
FEC Code = 2 (BPSK-D)
FEC Rate = 1 (1/2)

f. Enter 135 on bit sync key-pad and verify
Data Rate = 5.000*10**4
Input Code = 0 (NRZ-L)
FEC Code = 0 (OFF)
FEC Rate = N/A

g. Enter 136 on bit sync key-pad and verify
Data Rate = 1.5000*10**5
Input Code = 1(NRZ-M)
FEC Code = 0 (OFF)
FEC Rate = N/A

h. Enter 137 on bit sync key-pad and verify
Data Rate = 1.500*10**5
Input Code = 3 (BiO-L)
FEC Rate = 0 (OFF)
FEC Rate = N/A

Check:_____

(13) Verify the RS232C terminal cable is connected to the COM1 processor port Check:_____

(14) Verify the PC Keyboard is connected. Check:_____

(15)Verify proper setup of the power supply by:
Disconnect the power cable from the PC 104 stack
Turn on the power supply
Using calibrated DMM, set voltage as measured at pin 1 to +5V
Connect power cable to PC104 stack Check:_____

CHAMBER SETUP

(16) Verify that 3 fully charged GN2 tanks are available. Check:_____

(17) Connect 1 GN2 tank to chamber. Verify pressure is >1800PSI Check:_____

(18) Verify that the drip pan is in place. Check:_____

(19) Verify that all cable feed-throughs are blocked and sealed. Check:_____

(20) Turn on the chamber. Check:_____

(21) Verify the following chamber parameters: Check:_____

ITEM	CONTENTS	COMMENTS
IN	Rt.d	
C_F	C	Degrees C
RL	-73.3	
RH	200.0	
Ot1	Ht	
Hys1	1.5	
Ot2	CL	
Hys2	1.5	
Ot3	AL	
AL1	Pr	
Lat1	NLa	
Hys3	1.5	
Oth	AL	
AL2	Pr	
LAT2	NLA	
Hys4	1.5	
Rtd	J15	
PtYp	RATE	Rates instead of times
95d	0.0	
Pout	Cont	
PsLp	StPt	
BAUD	9600	
Data	7o	
Prot	FULL	
Addr	0	

The following are the settings in the stored Profiles of the Tenney Chamber. The items in steps 1-13 are set to reflect the "Specification Survivability " cycle. Note that the 5 degree/minute ramp rate is not achievable using Tenney Chamber in B23 Room E422. It achieves 2 degrees/minute when going cool at temperatures below 0 degrees. Also note that the HOT TRANSITION rates (Cold-Hot) are varied in attempt to reduce condensation. A preprogrammed overshoot of the desired temperatures during cycles 3-6 are planned in attempt to get the TDI board to the desired temperature more quickly.

Profile Step Number	Profile Contents	Comments
1	EnSp=85,Rate=5	Ambient to 85deg, 5deg/min
2	End=Hold	Wait
3	EnSp=50, Rate=5	85deg->50 deg, 5 deg/min
4	End=Hold	Wait
5	EnSp=-55, Rate=5	Transition to –55, rate not achievable
6	End=Hold	Wait
7	EnSp=-30, Rate=3	-55 to –30 @ 3deg/min. Rate chosen to give board time to track.
8	End=Hold	Wait
9	EnSp=-5, Rate=3	-30 to –5 @3 deg/min. Rate to get board to track.
10	EnSp=5, Rate=1.5	-5 to +5 @1.5 deg/min to minimize chance of condensation.
11	EnSp=24, Rate=3	Transition to Ambient @3 deg
12	End=HOLD	Wait
13	END=OFF	Used to end a test for the day
14	EnSp=85, Rate5	Overshoot Hot @5 deg /Min
15	Soak Hour=0, Min=5, Sec=0	Hold 85 for 5 minutes to give board a chance to get close to 80 deg
16	EnSp=80, Rate=5	85 to 80 deg – Hot Plateau
17	End=Hold	Wait
18	EnSp=0, Rate=4	Transition to 0 deg @4 deg/min should be attainable
19	EnSp=-45, Rate=1.5	Overshoot Cold Plateau by 5 deg. Rate chosen to see that we getr there.
20	Soak Hours=0, Mins=5, Sec=0	Soak at –45 to give TDI board chance to get to –40.
21	EnSp=-40, Rate=3	Cold Plateau
22	End=Hold	Wait
23	JS=9, JL=1	Jump to step 9, the transition to ambient.
24	End=hold	Just in case

DATA ACQUISITION SETUP

(22) Verify the location of each thermocouple used: Check:_____

1 TDI Board #1 FPGA
2 TDI Board #1 External Edge
3 TDI Board #1 External Edge
4 Chamber Wall – Left

5 Chamber Wall - Right
6 PC-104/"Flight-like" CDM processor

(23) Verify that all unused thermocouples are securely tied down in the chamber Check:_____

(24) Verify all thermocouples read current chamber temperature within +/- 5 degrees Check:_____

(25) Turn the chamber off. Check:_____

CHAMBER CLOSEOUT
(26)Verify that the GSE and Chamber are grounded Check:_____

(27) Verify that the chamber door is closed. Check:_____

(28) Verify the chamber main power is on. Check:_____

(29) Power the PC-104/"Flight-like" CDM system. Check:_____

(30) Load the diagnostic software. Check:_____
Verify FIFO LOAD MODE = NORMAL
Verify Mission Mode = ULDB

(31) Run Sections 3.2 , 3.3 and 3.13 of the TDI "ULDB MODE" System Functional Test.
Check:_____
Circle:PASS/FAIL

(32) Power down the PC-104/"Flight-like" CDM Check:_____

3.2 Continuous Temperature and GN2 Monitoring

All temperatures shall be read and recorded every 5 minutes. GN2 pressures shall be read every 10 minutes. Check:_____

3.3 Cycle #1 (Specification Survivabilty) Test
(1) Set the GN2 purge flow rate to 10 cfh.. Check:_____

(2) Log the GN2 tank pressure and flow rate on the attached form every 10 minutes. If tank pressure is below 300 psi, disable the drained tank and enable a charged tank.
Check:_____

(3) Turn on chamber(OVER TEMP) Check:_____

(4) At the thermal chamber, run the profile starting at Profile Step 1.Date:_____, Time:_____
Check:_____

(5) Note when TCs 2-5 average 85deg C +/- 2C. Date:_____ Time:_____
Check:_____

(6) Wait 2 hours. Check:_____

(7) On the thermal chamber, run profile starting at Profile Step 3 Check:_____

(8) When TCs 2-5 average 50deg C +/- 2C note the date and time.Date:_____ Time:_____
Check:_____

(9) Apply power to the "Flight-like" CDM. Check:_____

(10)Run the diagnostic software.
Verify FIFO LOAD MODE=NORMAL
Verify MISSION MODE=ULDB
If different, toggle settings until get the above modes Check:_____

(11)Execute Step 3.2 of ULDB MODE SFT to verify HARD RESET status. Note Time of successful powerup. Date:_____ Time:_____
Check:_____

(12)Repeatedly execute steps 3.3 thru 3.19 of the ULDB MODE SFT for at least 2 hours. Note date and time of completion. Issue pulse command using HP pulse generator to select PCM-A between iterations . Do not issue pulse command after the last iteration.Stop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

(13)Power down the "Flight-like" CDM. Check:_____

(14)On the thermal chamber, run profile starting at Profile Step 5 Check:_____

(15)Set GN2 flow to 5cfh. Check:_____

(16)When TCs 2-5 average –55deg C +/- 2 C, note the date and time.Date:_____ Time:_____
Check:_____

(17)Wait 2 hours. Check:_____

(18)On the thermal chamber, run profile starting at Profile Step 7. Check:_____

(19)When TCs 2-5 average –30deg C +/- 2C, note date and time. Date:_____ Time:_____
Check:_____

(20)Apply power to the "Flight-like"CDM. Check:_____

(21)Run the diagnostic software.
Verify FIFO LOAD MODE=NORMAL
Verify MISSION MODE=ULDB
If different, toggle settings until get the above modes Check:_____

(22)Execute Step 3.2 of ULDB MODE SFT to verify HARD RESET status. Note Time of successful powerup. Date:_____ Time:_____
Check:_____

(23)Repeatedly execute steps 3.3 thru 3.19 of the ULDB MODE SFT for at least 2 hours. Note date and time of completion. Issue pulse command using HP pulse generator to select PCM-A between iterations . Do not issue pulse command after the last iteration.Stop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

(24)At the thermal chamber, run profile starting at Profile Step 9 .Date:_____ Time:_____
Check:_____

(25)Set GN2 flow to 10cfh Check:_____

(26)Patch B1TLM to BS#1 S0 IN Check:_____

(27) Verify PCM-B discrete deck is selected by reading I/O Port 0x01 and verifying msb = 1. If it is not 1, the test FAILED. Check:_____
Circle:PASS/FAIL

(28)Enter 134 on bit sync keypad to configure bit sync as follows:
Data Rate:100Ksymbols/sec
Input Code:NRZ-L
FEC Code:BPSK-D
Rate:1/2
Check:_____

(29)Place TDI Board in FIFO-ENCODED at 50Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODED
Toggle SOURCE to FIFO
Change clock register to 0x04c
Check:_____

(30)Press RESTART on FIREBIRD 6000. Check:_____

(31)When TCs 2-5 averages 24deg +/- 2 deg , note Date:_____ Time:_____
Check:_____

(32)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(33)Verify PCM-B discrete deck is selected by reading I/O port 0x01 and verifying msb=1. If it is not 1, the test FAILED. Check:_____
Circle: PASS/FAIL

(34)Select PCM-A by generating pulse command using HP pulse generator. Verify A selected by reading I/O port 0x01 and verifying msb is ZERO. Check:_____
Circle:PASS/FAIL

(35)Place TDI Board in FIFO-ENCODED at 50Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODED
Toggle SOURCE to FIFO
Change clock register to 0x04c
Check:_____

(36)Press RESTART on FIREBIRD 6000. Check:_____

(37)Wait 2 minutes. Check:_____

(38)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(39)Either suspend test or continue on by:

a. Stop Test by powering down GSE, power down the CDM , opening chamber door, stopping GN2 flow, executing Profile Step 13 and powering down the chamber.

Check:_____

OR

b. Continue with step 3.4 Check:_____

3.4 Cycle #2 (Extended Survivability) Test

(1) Turn off the Chamber temperature control. Check:_____

(2) Modify the EnSp parameters at the following steps to reflect the "extended range survivability test limits.
Step #3 set EnSp= 80.
Step #7, set EnSp=-40

Check:_____

(3) Set the GN2 purge flow rate to 10 cfh. Check:_____

(4) Log the GN2 tank pressure and flow rate on the attached form every 10 minutes. If tank pressure is below 300 psi, disable the drained tank and enable a charged tank.

Check:_____

(5) If chamber is not on, turn on chamber. Check:_____

(6) At the thermal chamber, run the profile starting at Profile Step 1.Date:_____, Time:_____
Check:_____

(7) Note when TCs 2-5 average 85deg C +/- 2C. Date:_____ Time:_____
Check:_____

(8) Wait 2 hours. Check:_____

(9) On the thermal chamber, run profile starting at Profile Step 3 Check:_____

(10)When TCs 2-5 average 80deg C +/- 2C note the date and time.Date:_____ Time:_____
Check:_____

(11)Apply power to the "Flight-like" CDM. Check:_____

(12)Run the diagnostic software.
Verify FIFO LOAD MODE=NORMAL
Verify MISSION MODE=ULDB
If different, toggle settings until get the above modes Check:_____

(13)Execute Step 3.2 of ULDB MODE SFT to verify HARD RESET status. Note Time of successful powerup. Date:_____ Time:_____
Check:_____

(14)Repeatedly execute steps 3.3 thru 3.19 of the ULDB MODE SFT for at least 2 hours. Note date and time of completion. Issue pulse command using HP pulse generator to select PCM-A between iterations . Do not issue pulse command after the last iterationStop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

(15)Power down the "Flight-like" CDM. Check:_____

(16)On the thermal chamber, run profile starting at Profile Step 5. Check:_____

(17)Set GN2 flow to 5 cfh Check:_____

(18)When TCs 2-5 average –55deg C +/- 2 C, note the date and time.Date:_____ Time:_____
Check:_____

(19)Wait 2 hours. Check:_____

(20)On the thermal chamber, run profile starting at Profile Step 7. Check:_____

(21)When TCs 2-5 average –40deg C +/- 2C, note date and time. Date:_____ Time:_____
Check:_____

(22)Apply power to the "Flight-like"CDM. Check:_____

(23)Run the diagnostic software.
Verify FIFO LOAD MODE=NORMAL
Verify MISSION MODE=ULDB
If different, toggle settings until get the above modes Check:_____

(24)Execute Step 3.2 of ULDB MODE SFT to verify HARD RESET status. Note Time of successful powerup. Date:_____ Time:_____
Check:_____

(25)Repeatedly execute steps 3.3 thru 3.19 of the ULDB MODE SFT for at least 2 hours. Note date and time of completion. Issue pulse command using HP pulse generator to select PCM-A between iterations . Do not issue pulse command after the last iterationStop Date:_____ Time:_____:
Check:_____
Circle:PASS?FAIL

(26)At the thermal chamber, run profile starting at Profile Step 9. Date:_____ Time:_____
Check:_____

(27)Set GN2 flow rate to 10 cfh Check:_____

(28)Patch B1TLM to BS#1 S0 IN Check:_____

(29) Verify PCM-B discrete deck is selected by reading I/O Port 0x01 and verifying msb = 1. If it is not 1, the test FAILED. Check:_____
Circle:PASS/FAIL

(30)Enter 134 on bit sync keypad to configure bit sync as follows:
Data Rate:100Ksymbols/sec
Input Code:NRZ-L
FEC Code:BPSK-D
Rate:1/2
Check:_____

(31)Place TDI Board in FIFO-ENCODED at 50Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODED
Toggle SOURCE to FIFO

Change clock register to 0x04c

Check:_____

(32)Press RESTART on FIREBIRD 6000. Check:_____

(33)When TCs 2-5 average 24 deg +/2 deg , note Date:_____ Time:_____
Check:_____

(34)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(35)Verify PCM-B discrete deck is selected by reading I/O port 0x01 and verifying msb=1. If it is not 1, the test FAILED. Check:_____
Circle: PASS/FAIL

(36)Select PCM-A by generating pulse command using HP pulse generator. Verify A selected by reading I/O port 0x01 and verifying msb is ZERO. Check:_____
Circle:PASS/FAIL

(37)Place TDI Board in FIFO-ENCODED at 50Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODED
Toggle SOURCE to FIFO
Change clock register to 0x04c

Check:_____

(38)Press RESTART on FIREBIRD 6000. Check:_____

(39)Wait 2 minutes. Check:_____

(40)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(41)Either suspend test or continue on by:

a. Stop Test by powering down GSE, execute profile step 13, power down the CDM , opening chamber door, stopping GN2 flow and powering down the chamber.

Check:_____

OR
b. Continue with step 3.5 Check:_____

3.5 Cycles 3-4 ULDB MODE Extended Temperature Tests

(1) Set the GN2 purge flow rate to 10 cfh. Check:_____

(2) Log the GN2 tank pressure and flow rate on the attached form every 10 minutes. If tank pressure is below 300 psi, disable the drained tank and enable a charged tank.
Check:_____

(3) If chamber is not on, turn on chamber. Check:_____

(4) If CDM is NOT powered, power up the "Flight-like" CDM, run the diagnostic software.
Verify FIFO LOAD MODE=NORMAL
Verify MISSION MODE=ULDB
If different, toggle settings until get the above modes
Execute Step 3.2 of ULDB MODE SFT to verify HARD RESET status.
Check:_____
Circle:PASS/FAIL

(5) Enter 130 on bit sync keypad to configure bit sync as follows:
Data rate = 300Ksymbols/Sec
Input Code = NRZ-L
FEC Code = BPSK-D
Rate: ½
Check:_____

(6) Patch A1TLM to BS#1 S0 IN Check:_____

(7) Verify PCM-A discrete deck is selected by reading I/O Port 0x01 and verifying msb = 0. If it is not 0, the test FAILED Check:_____
Circle:PASS/FAIL

(8) Put TDI board in FIFO – Encoded at 150Kpbs (300Ksymbols/sec) by selecting the FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODING
Toggle SOURCE to FIFO
Change clock register to 0x028
Check:_____

(9) Select BERT pattern 63. Press RESTART on the FIREBIRD 6000 Check:_____

---- Hot Transition (+80 deg C) Powered ------

(10)At the thermal chamber, run the profile starting at Profile Step 14.Date:_____, Time:_____
Check:_____

(11)Note when TCs 2-5 average 80deg C +/- 2C. Date:_____ Time:_____
Check:_____

(12)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(13)Execute steps 3.3 thru 3.19 of the ULDB MODE SFT. Note date and time of completion.
Stop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

----- COLD Transition (-40deg C) Powered -----

(14)On the thermal chamber, run profile starting at Profile Step 18. Check:_____

(15)Set GN flow rate to 5 cfh Check:_____

(16)Patch B1TLM to BS#1 S0 IN Check:_____

(17) Verify PCM-B discrete deck is selected by reading I/O Port 0x01 and verifying msb = 1. If it is not 1, the test FAILED. Check:_____
Circle:PASS/FAIL

(18)Enter 134 on bit sync keypad to configure bit sync as follows:
Data Rate:100Ksymbols/sec
Input Code:NRZ-L
FEC Code:BPSK-D
Rate:1/2
Check:_____

(19)Place TDI Board in FIFO-ENCODED at 50Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODED
Toggle SOURCE to FIFO
Change clock register to 0x04c
Check:_____

(20)Press RESTART on the FIREBIRD 6000 Check:_____

(21)When TCs 2-5 average –40deg C +/- 2 C, note the date and time.Date:_____ Time:_____
Check:_____

(22)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(42)Verify PCM-B discrete deck is selected by reading I/O port 0x01 and verifying msb=1. If it is not 1, the test FAILED. Check:_____
Circle: PASS/FAIL

(23)Select PCM-A by generating pulse command using HP pulse generator. Verify A selected by reading I/O port 0x01 and verifying msb is ZERO. Check:_____
Circle:PASS/FAIL

(24)Execute steps 3.3 thru 3.19 of the ULDB MODE SFT. Note date and time of completion.
Stop Date:_____ Time:_____:

Check:_____
Circle:PASS/FAIL

------ HOT Transition (Powered) -----

(25)Set GN2 flow rate to 10 cfh. Check:_____

(26)On the thermal chamber, run profile starting at Profile Step 23. Check:_____

(27)Verify PCM-B discrete deck is selected by reading I/O Port 0x01 and verifying msb = 1. If it is not 1, the test FAILED. Check:_____
Circle:PASS/FAIL

(28)Enter 131 on bit sync keypad to configure bit sync as follows:
Data Rate:150Kb/sec
Input Code:NRZ-L
FEC Code:OFF
Rate:1/2
Check:_____

(29)Patch B2TLM to BS#1 S0 in Check:_____

(30)Place TDI Board in FIFO-UNENCODED at 150Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to RAW
Toggle SOURCE to FIFO
Change clock register to 0x028
Check:_____

(31)Press RESTART on the FIREBIRD 6000 Check:_____

(32)When chamber temperature display indicates 24 degrees attained and the RUN light is not lit, run Profile Step 14. Check:_____

(33)When TCs 2-5 averages 80deg C +/- 2C, note date and time. Date:_____ Time:_____
Check:_____

(34)Set GN2 flow rate to 5 cfh Check:_____

(35)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(43)Verify PCM-B discrete deck is selected by reading I/O port 0x01 and verifying msb=1. If it is not 1, the test FAILED. Check:_____
Circle: PASS/FAIL

(36)Select PCM-A by generating pulse command using HP pulse generator. Verify A selected by reading I/O port 0x01 and verifying msb is ZERO. Check:_____
Circle:PASS/FAIL

(37)Execute steps 3.3 thru 3.19 of the ULDB MODE SFT. Note date and time of completion.
Stop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

---- COLD Transition (Powered) ----

(38)On the thermal chamber, run profile starting at Profile Step 18. Check:_____

(39)Select PCM-A discrete deck by generating discrete deck pulse command using HP pulse generator. Verify PCM-A is selected by reading I/O prot 0x01 and verifying msb is ZERO. If it is not ZERO the test failed. Check:_____
Circle:PASS/FAIL

(40) Enter 131 on bit sync keypad to configure bit sync as follows:
Data Rate:150Kb/sec
Input Code:NRZ-L
FEC Code:OFF
Rate:1/2
Check:_____

(41)Patch A2TLM to BS#1 S0 IN Check:_____

(42)Place TDI Board in FIFO-UNENCODED at 150Kbps (100Ksymbols/sec) by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to RAW
Toggle SOURCE to FIFO
Change clock register to 0x028
Check:_____

(43)Press RESTART on the FIREBIRD 6000 Check:_____

(44)When TCs 2-5 average –40deg C +/- 2C, note date and time. Date:_____ Time:_____
Check:_____

(45)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(46)Verify A selected by reading I/O port 0x01 and verifying msb is ZERO. If not ZERO then the test FAILED Check:_____
Circle:PASS/FAIL

(47)Execute steps 3.3 thru 3.19 of the ULDB MODE SFT. Note date and time of completion.
Stop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

---- Ambient Transition (Powered) ----

(48)Set GN2 flow rate to 10 cfh. Check:_____

(49)On thermal chamber, run profile starting at Profile Step 23 to bring chamber to Ambient.
Check:_____

(50)Select PCM-A discrete deck by generating discrete deck pulse command using HP pulse generator. Verify PCM-A is selected by reading I/O prot 0x01 and verifying msb is ZERO. If it is not ZERO the test failed.
Check:_____
Circle:PASS/FAIL

(51) Enter 130 on bit sync keypad to configure bit sync as follows:
Data Rate:300Ksymbols/sec
Input Code:NRZ-L
FEC Code:BPSK-D
Rate:1/2
Check:_____

(52)Patch A1TLM to BS#1 S0 IN Check:_____

(53)Place TDI Board in BERT UNENCODED at 150Kbps by selecting FLOW DATA option of the diagnostic software. Enter
BERT6.BIN for the file name
Toggle ENCODING to ENCODING
Toggle SOURCE to BERT
Change clock register to 0x028
Check:_____

(54)Configure BERT generator for 2047 test pattern. Press RESTART on the FIREBIRD 6000
Check:_____

(55)When TCs 2-5 average 24deg C +/- 2C, note date and time. Date:_____ Time:_____
Check:_____

(56)Record Block Errors:_____ BLOCKS:_____. If Block Errors NON_ZERO or BLOCK is Zero or the FIREBIRD SYNC LOSS light is lit, the test failed.
Check:_____
Circle:PASS/FAIL

(57)Verify A selected by reading I/O port 0x01 and verifying msb is ZERO. If msb is not ZERO, then the test FAILED.
Check:_____
Circle:PASS/FAIL

(58)Execute steps 3.3 thru 3.19 of the ULDB MODE SFT. Stop Date:_____ Time:_____:
Check:_____
Circle:PASS/FAIL

(59)Power down "Flight-like" CDM. Check:_____

(60)Stop GN2 flow. Check:_____

(61)Run Profile Step 13 to terminate control of chamber. Check:_____

(62)Either suspend test or continue to LDB mode testing as follows:

a. Suspend test by powering down GSE and the chamber. Check:_____

OR

b. Continue with step 3.6

3.6 Cycles 5-6 LDB MODE Extended Temperature Tests

(1) Open chamber door. Check:_____

(2) Install jumper to configure TDI board for LDB mode Check:_____

(3) Set FIFO B interrupt select dip switches to INT 11 (6 ON all others OFF).Check:_____

(4) If GSE is not powered, power GSE. Check:_____

(5) If chamber is not powered, power chamber. Check:_____

(6) Power the "Flight like" CDM. Check:_____\

(7) Load diagnostic software setting software modes to
a. FIFO LOAD MODE=NORMAL
b. MISSION MODE=LDB
If different, toggle settings until get the above modes. Check:_____

(8) Execute step 3.2 of the LDB MODE SFT to verify Hard Reset status. Check:_____
Circle:PASS/FAIL

(9) Execute step 3.3 of LDB MODE SFT to exercise TDI in REALTIME mode with FIFO data on A and B. Check:_____
Circle:PASS/FAIL

(10)Place TDI in Playback mode with BERT on A and FIFO on B by:
Toggle LDB MODE to PLAYBACK
Toggle A DATA Source to BERT
If necessary, toggle A ENCODING to ENCODED
If necessary, toggle B DATA SOURCE to FIFO
If necessary, toggle B ENCODING to ENCODED
Set B Clock Register to 0x4C
Check:_____

(11)Verify TDI is in the correct mode by:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 130 on bit sync to configure as follows:
Data Rate: 300Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:
a. Patch B1TLM to BS#1 S0 IN
b. Enter 134 on bit sync keypad to configure bit sync as follows:
Data Rate: 100Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½

c. Configure FIREBIRD 6000 for pattern 63. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____

----- HOT Transition (Powered)

(12)At the thermal chamber, run profile starting at Profile Step 14.Date:_____ Time:_____
Check:_____

(13)Set GN2 flowrate to 10 cfh Check:_____

(14)When chamber temperature display reaches 60 degrees, monitor A1TLM, A2TLM, B1TLM and B2TLM for errors. This is accomplished as follows:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 130 on bit sync to configure as follows:
Data Rate: 300Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

A2TLM:
a. Patch A2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:
a. Patch B1TLM to BS#1 S0 IN
b. Enter 134 on bit sync keypad to configure bit sync as follows:
Data Rate: 100Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 63. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM:
a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____
Circle:PASS/FAIL

(15)When TCs 2-5 average 80 deg C +/- 2C, note date and time. Date:_____ Time:_____
Check:_____

(16)Exit FLOW DATA portion of the diagnostic software Check:_____

(17)Execute steps 3.3 through 3.14 of LDB MODE SFT. Check:_____
Circle:PASS/FAIL

(18)Configure TDI board for A Processor FIFO, B Processor BERT by executing the following:
Select FLOW DATA option of diagnostic software
Enter: BERT9.BIN for FIFO A file name
Enter:BERT6.BIN for FIFO B file name
If necessary, toggle A DATA Source to FIFO
If necessary, toggle A DATA Encoding to ENCODED
If necessary, toggle B DATA Source to BERT
If necessary, toggle B DATA Encoding to ENCODED
Set A Clock Register to 0x4c
Set B Clock Register to 0x 28
If necessary, toggle LDB MODE to PLAYBACK

Check:_____

(19)Verify the TDI configuration by:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 134 on bit sync to configure as follows:
Data Rate: 100Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 511. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:
a. Patch B1TLM to BS#1 S0 IN
b. Enter 130 on bit sync keypad to configure bit sync as follows:
Data Rate: 300Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

Check:_____

---- COLD Transition (Powered)----

(20)At the thermal chamber, run profile starting at Profile Step 18.Date:_____ Time:_____
Check:_____

(21)Set GN2 flow rate to 5 cfh Check:_____

(22)When chamber temperature is below –20 degrees, monitor A1TLM, A2TLM, B1TLM and B2TLM for errors. This is accomplished as follows:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 134 on bit sync to configure as follows:
Data Rate: 100Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½

c. Configure FIREBIRD 6000 for pattern 511. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

A2TLM:
a. Patch A2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:
a. Patch B1TLM to BS#1 S0 IN
b. Enter 130 on bit sync keypad to configure bit sync as follows:
Data Rate: 300Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM:
a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____
Circle:PASS/FAIL

(23)Wait for TCs 2-5 to average –40deg C +/- 2 C. Note date and time.Date:_____Time:_____
Check:_____

(24)Exit the FLOW DATA section of the diagnostic software. Check:_____

(25)Execute steps 3.3 through 3.14 of LDB MODE SFT. Check:_____
Circle:PASS/FAIL

(26)Configure TDI board for REALTIME A Processor FIFO
Select the FLOW DATA section of the diagnostic software.
Enter: BERT6.BIN for FIFO A data file
Enter:BERT9.BIN for FIFO B data file.
If necessary, toggle A DATA Source to FIFO
If necessary, toggle A DATA Encoding to ENCODED
Set A Clock register to 0x28
If necessary, toggle LDB MODE to REALTIME
If necessary, toggle LDB STREAM to A

Check:_____

(27)Verify TDI configuration by:
A2TLM:
a. Patch A2TLM to BS#1 S0 IN
b. Enter 130 on bit sync to configure as follows:
Data Rate: 300Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 63. Press Restart.

d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM: a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

Check:_____

---- HOT Transition (Powered)----

(28)At the thermal chamber, run profile starting at Profile Step 23.Date:_____ Time:_____
Check:_____

(29)Set GN2 flow rate to 10 cfh Check:_____

(30)When chamber temperature display reaches 24 deg C and the RUN light is not lit, run Profile Step 14.
Check:_____

(31)When chamber temperature exceeds 60 degrees, monitor A1TLM, A2TLM, B1TLM and B2TLM for errors. This is accomplished as follows:

A1TLM: a. Patch A1TLM to BS#1 S0 IN
b. Enter 130 on bit sync to configure as follows:
Data Rate: 300Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 63. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

A2TLM: a. Patch A2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM: a. Patch B1TLM to BS#1 S0 IN
b. Press RESTART on FIREBIRD 6000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM: a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____
Circle:PASS/FAIL

(32)Wait for TCs 2-5 average 80deg C +/- 2 C. Note date and time.Date:_____ Time:_____
Check:_____

(33)Set GN2 flow rate to 5 cfh Check:_____

(34)Exit FLOW DATA section of diagnostic software. Check:_____

(35)Execute steps 3.3 through-3.14 of LDB MODE SFT. Check:_____
Circle:PASS/FAIL

(36)Configure TDI board for REALTIME B Processor FIFO by executing the following:
Select the FLOW DATA section of the diagnostic software.
Enter: BERT6.BIN for FIFO A data file
Enter:BERT9.BIN for FIFO B data file.
If necessary, toggle B DATA Source to FIFO
If necessary, toggle B DATA Encoding to ENCODED
Set B Clock register to 0x28
If necessary, toggle LDB MODE to REALTIME
If necessary, toggle LDB STREAM to B
Check:_____

(37)Verify TDI board configuration by:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 130 on bit sync to configure as follows:
Data Rate: 300Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 511 Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:
a. Patch B1TLM to BS#1 S0 IN
b. Press RESTART on FIREBIRD 6000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

Check:_____

---- COLD Transition (Powered)----

(38)At the thermal chamber, run profile starting at Profile Step 18.Date:_____ Time:_____
Check:_____

(39)When the chamber temperature is below –20 degrees, monitor A1TLM, A2TLM, B1TLM and B2TLM for errors. This is accomplished as follows:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 130 on bit sync to configure as follows:
Data Rate: 300Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 511 Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

A2TLM:
a. Patch A2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM: a. Patch B1TLM to BS#1 S0 IN
b. Press RESTART on FIREBIRD 6000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM: a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____
Circle:PASS/FAIL

(40)Wait for TCs 2-5 average –40deg C +/- 2 C. Note date and time.Date:_____ Time:_____
Check:_____

(41)Exit the FLOW DATA section of the diagnostic software. Check:_____

(42)Execute steps 3.3 through 3.14 of LDB MODE SFT. Check:_____
Circle:PASS/FAIL

(43)Configure TDI board for A Processor BERT, B Processor FIFO by executing the following:
Select the FLOW DATA section of the diagnostic software.
Enter: BERT6.BIN for FIFO A data file
Enter:BERT9.BIN for FIFO B data file.
If necessary, toggle A DATA Source to BERT
If necessary, toggle A DATA Encoding to ENCODED
If necessary, toggle B DATA Source to FIFO
If necessary, toggle B DATA Encoding to ENCODED
Set A Clock Register to 0x4C
Set B Clock register to 0x28
If necessary, toggle LDB MODE to PLAYBACK

Check:_____

(44) Verify the TDI Configuration by:

A1TLM:a. Patch A1TLM to BS#1 S0 IN
b. Enter 134 on bit sync to configure as follows:
Data Rate: 100Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:a. Patch B1TLM to BS#1 S0 IN
b. Enter 130 on bit sync keypad to configure bit sync as follows:
Data Rate: 300Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 511. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

Check:_____

---- AmbientTransition (Powered)----

(45)At the thermal chamber, run profile starting at Profile Step 23.Date:_____ Time:_____
Check:_____

(46)Set GN2 flow rate to 10 cfh Check:_____

(47)When chamber temperature is above 0 degrees, monitor A1TLM, A2TLM, B1TLM and B2TLM for errors. This is accomplished as follows:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 134 on bit sync to configure as follows:
Data Rate: 100Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

A2TLM:
a. Patch A2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM:
a. Patch B1TLM to BS#1 S0 IN
b. Enter 130 on bit sync keypad to configure bit sync as follows:
Data Rate: 300Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 511. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM:
a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____
Circle:PASS/FAIL

(48)Wait for TCs 2-5 to average 24deg C +/- 2 C. Note date and time.Date:_____ Time:_____
Check:_____

(49),Monitor A1TLM, A2TLM, B1TLM and B2TLM for errors. This is accomplished as follows:

A1TLM:
a. Patch A1TLM to BS#1 S0 IN
b. Enter 134 on bit sync to configure as follows:
Data Rate: 100Ksymbols/sec
Input Code: NRZ-L
FEC Code: BPSK-D

Rate: ½
c. Configure FIREBIRD 6000 for pattern 2047. Press Restart.
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

A2TLM: a. Patch A2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B1TLM: a. Patch B1TLM to BS#1 S0 IN
b. Enter 130 on bit sync keypad to configure bit sync as follows:
Data Rate: 300Ksymbols/Sec
Input Code: NRZ-L
FEC Code: BPSK-D
Rate: ½
c. Configure FIREBIRD 6000 for pattern 511. Press RESTART
d. Wait 2 minutes.
e. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

B2TLM: a. Patch B2TLM to BS#1 S0 IN.
b. Press RESTART on FIREBIRD 60000
c. Wait 2 minutes.
d. Record Block Errors_____ and Blocks:_____ SYNCLOSS _____

If Block Errors is NON-ZERO for any reading OR Blocks is ZERO OR SYNC LOSS light was light was on for any of the above readings, then test failed.

Check:_____
Circle:PASS/FAIL

(50)Power off the CDM. Check:_____

(51)Run Profile Step 13. Check:_____

(52)Power down the GSE. Check:_____

(53)Power down the thermal chamber. Check:_____

(54)Shut of GN2 purge to chamber. Check:_____

(55)Open chamber door. Check:_____

(56)Disconnect thermocouples from TDI. Check:_____

(57)Disconnect GSE cables from TDI. Check:_____

(58)Remove TDI from chamber. Check:_____

4. Declaration of Test Results

If there where no failures encountered during the execution of this test procedure that were not induced by procedural errors or GSE failures, then the TDI board in ULDB mode PASSES the TDI Prototype Thermal Test .

The test conductors and TDI system engineer declare that:

TDI board Serial Number:_____
FPGA Signature Number:_____

PASSED/FAILED(Circle One) the TDI Prototype Thermal Test on _____(date)

Test Conductor #1_____

Test Conductor #2_____

TDI Systems Engineer:_____

Sheet:_____ of _____

Date/Time	Cycle #	Chamber Temp	TC#1	TC#2	TC#3	TC#4	TC#5	TC#6	GN2 Pressure	GN2 Flow Rate	Comments

Figure 1.2-1
TDI "SPECIFICATION" SURVIVABILITY TEST

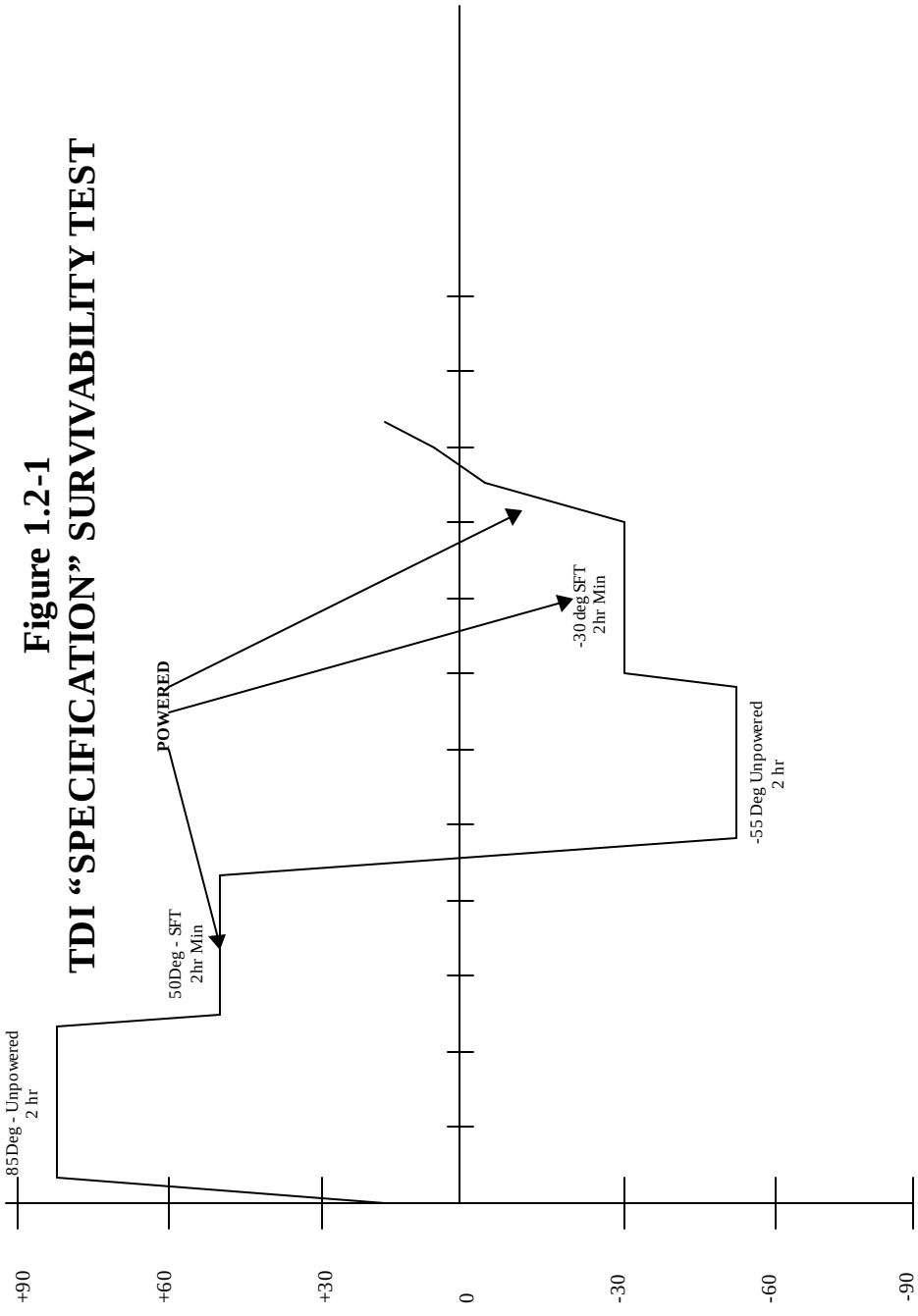

Figure 1.2-2
TDI "Extended" SURVIVABILITY TEST

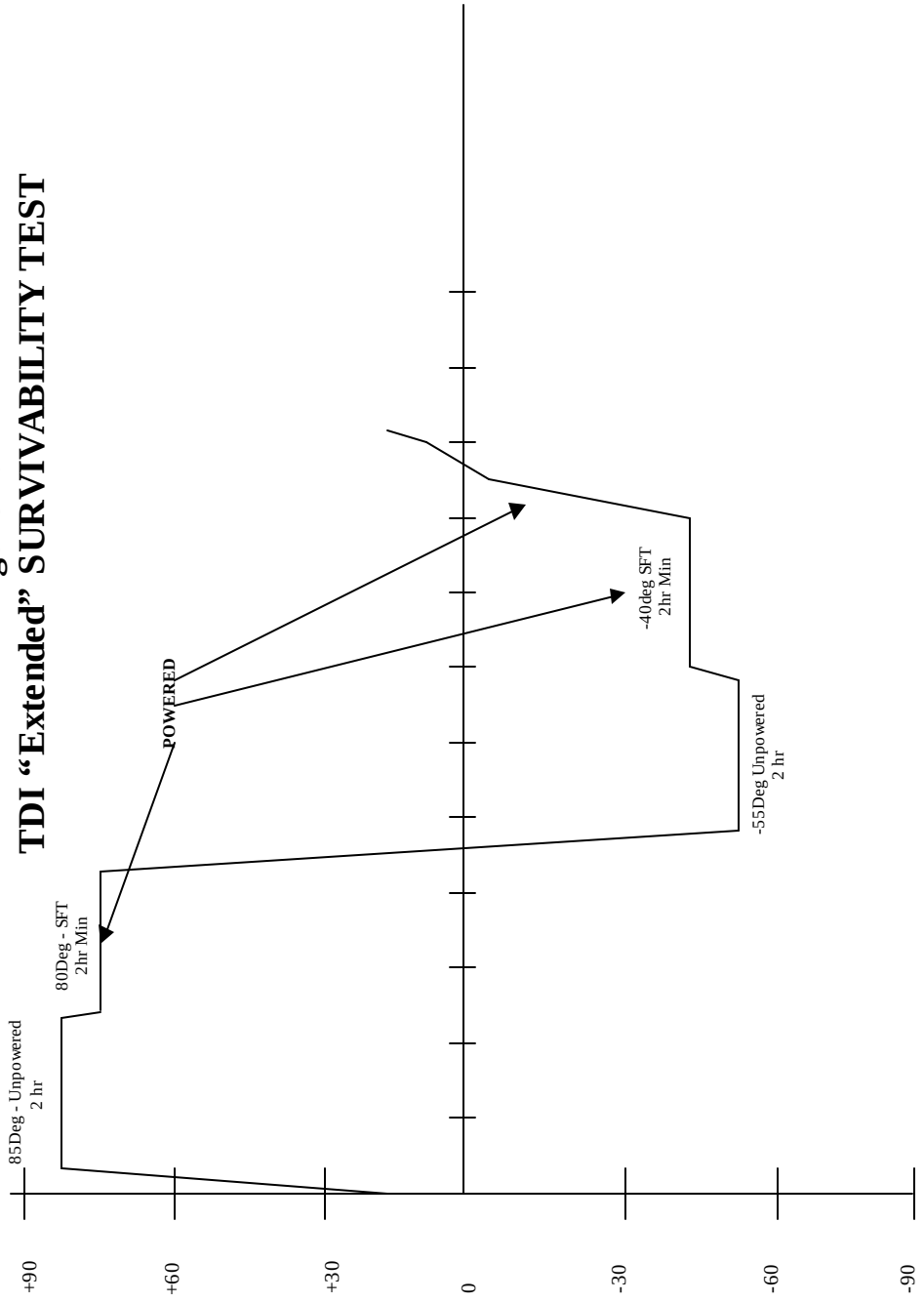

Figure 1.2-3
TDI "Extended" Temperature Tests

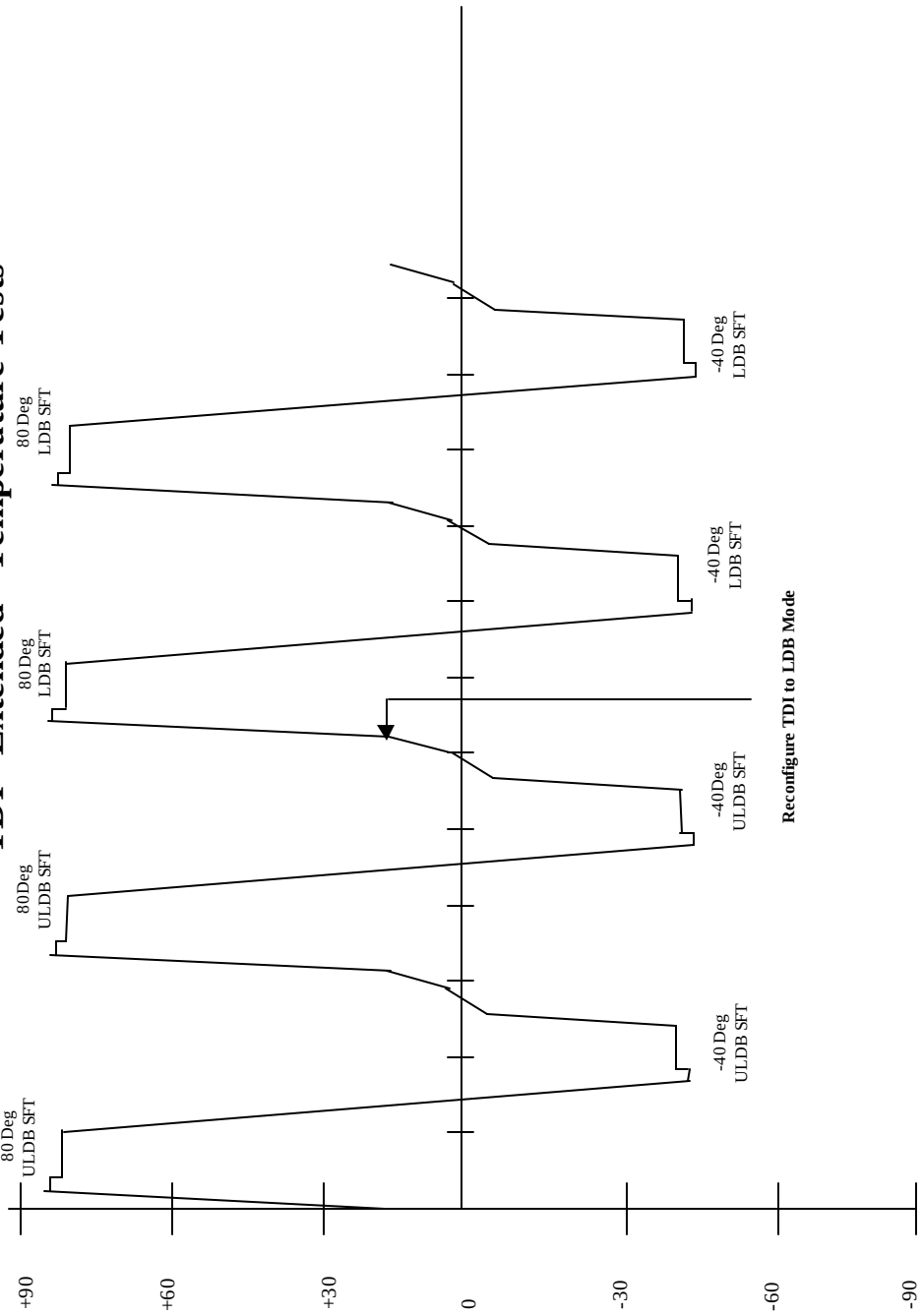

Figure 2.4-1THERMAL TEST SETUP